URBANIZATION IN NEST BUILDING OF INDIAN HOUSE CROWS (*CORVUS SPLENDENS* VIEILLOT)[1]

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(*With sixteen figures*)

Regarding the normal type of nest (-building) in the Indian house crow, one finds the statement by Sálim Ali (1972), that the "nest (consists of) a platform of twigs frequently intermixed with iron wire, with a cup-like depression lined with tow, coir fibre, etc., 10 feet or more up in a tree, sometimes several nests in the same tree...The koel commonly lays its eggs in crows' nests" (p. 91).

In 1927, E. H. Aitken reported that "in April and May crows make nests of sticks and line them with coir, or horsehair abstracted from a mattress, or even with soda-water wire stolen from the butler's little hoard. In these they bring up three or four callow criminals in their own image" (p. 61).

While this statement by EHA refers to the fancy city of Dustipore, probably a rural site in Northern India, the same author relates the crow situation in Bombay as follows: "In Bombay the crow population has multiplied to such an extent of late years that the competition for nesting materials has become terrible. In Marine Lines, as the season advances, the crows patrol the road or the garden walks, waiting for sticks to fall, or they get up into the trees and tug at twigs which are still green and will not come off. It is not many years since a pair living in the Fort discovered a real El Dorado in an optician's shop. They worked at that mine so stealthily and cleverly that before they were discovered they had succeeded in abstracting about Rs. 400 worth of spectacle frames which they had worked up into a very superior nest, combining durability and lightness like a "helical tube". The Museum of the Bombay Natural History Society contains a ponderous nest made entirely of iron wire, taken apparently from the ruins of railway fences" (p. 122, 2. edition). From a statement by Sálim Ali, the editor of the 3-edition in 1947, it can be gathered that this EHA-statement refers to about 1905 (the 2-edition featuring no year of publication). In 1947, Sálim Ali quotes from "The Birds of Bombay and Salsette" (by S. Ali and H. Abdulali) that "crows nesting on the overhead wire carriers of the newly electrified suburban section of the...railway (in 1922) held up the trains by the iron wire used as building material causing short circuit. A new type of insulated bracket had to be devised specially to overcome this unforeseen nuisance".

There are a few further notes on this peculiar habit of wire nesting in Indian crows (Hume, 1889; Dewar, 1929; Baker, 1932; Lamba, 1963), Indian doves (Walsh, 1924), Indian bulbuls (Lamba, 1968), and the latest report by Lamba (1976) states that "dry, usually thorny sticks are picked up from under the trees, hedges around the fields and farms,

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and from the firewood-piles of poorer people. If fallen sticks are not readily available, twigs are wrenched off the trees. Occasionally metal strips and wires are also brought in for incorporation in the outer framework".

In the non-Indian crows, this wire-nidification seems to be quite an exception: only Walford (1931) and De Vries (1953) report of *Corvus c. corone,* in two nests of which apart from rabbit bones ("a whole set of ribs being fixed in on one side") mainly steel wire had been used. One nest weighed 1845 g (quoted from Melde, 1969). Still, the nest found by Walford "was heavily lined with wool".

Apparently, since these earlier reports the situation in the big cities of India has changed as far as *Corvus splendens* is concerned, and it is for this reason that the following notes, observations and preliminary data are reported here. Moreover, apparently no numerical considerations have been done on the physical properties of crows' wire nests. We plan to extend our studies throughout other regions of India in the near future.

When visiting Calcutta or Bombay, one is struck by the fact that hundreds of nests of *Corvus splendens* are based on electric posts in crowded streets (fig. 1). Most of these nests are built exclusively or partly with metallic wire and pieces of flat sheet. A variety of nesting sites can be noticed, the street lamp probably being the most familiar and most often used. Sign boards on buildings, window sills, between cornices of residential buildings, on the posts supporting power lines of electric trains, on the ceiling of railway station platforms (Howrah!) and waiting halls are some other colonized sites (fig. 2).

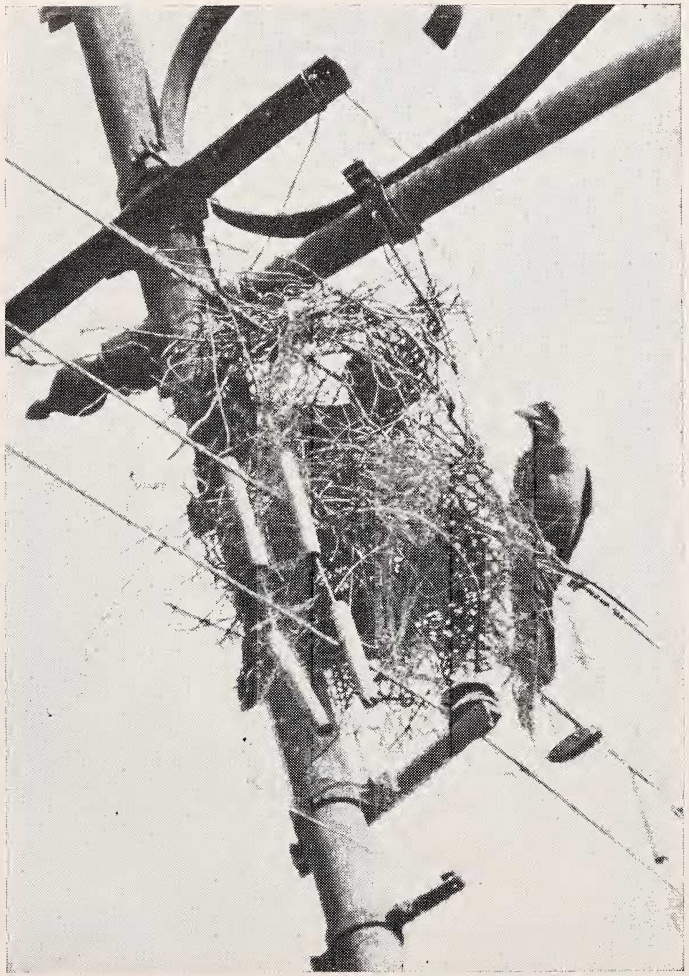
Sometimes many crows compete for one favourable site: on top of a five-storeyed building on the side of a busy road (Barrackpore Trunk Road) an illuminated signboard attracts four to five pairs of crows every year fighting for possession of this site. Ultimately, they compromise, each pair sharing a portion, and they make a sort of a community nest (fig. 3).

In some of the road-crossings in Calcutta, mercury lights on tall posts (fig. 4) have just been introduced. The different hands starting from the terminal of the post slant upwards providing a safe platform for the crow to establish a nest between them. On ordinary lamp posts, nests are built where there are some joints or projections. In such positions, it is not possible to establish twigs, but thin wire, already bent or twisted by the crow itself (fig. 5), is suitable for founding a nest. There is, however, no difficulty to establish a metal nest on trees because of their branching nature: from one large mango tree (*Mangifera indica*) growing in the heart of Calcutta, adjoining the offices of the Reserve Police at Baranagar, twentyfour nests were collected, all built mostly or exclusively with metal (fig. 6).

Normally in rural areas, the house crow builds nests with only dry twigs which may include dry, sharp and branched brambles. The bird also makes a cup inside the nest and lines it with fibre of pliable twigs (fig. 7). Seldom it uses rags and grass blades (see also the above quotations by earlier authors). The nesting season of *Corvus splendens* in the north-eastern parts of India begins in February and extends upto June, after which the heavy monsoon starts.

The use of wire and/or other types of metal depends mostly on the locality and availability of such material. Apparently, however, also a learning process in the sense of handing over the metal habit from crow to crow is concerned. Crows in general do not fetch their

Above: Fig. 1. Wire-nest of *Corvus splendens* in a busy street in Calcutta. *Below*: Fig. 3. Close-up view of the Indian house crow's work: wire and wood in a community nest.



Left: Fig. 2. Detail of wire-nest of *Corvus splendens*.
Right: Fig. 6. Metal nests on a dead tree.

nesting material from long distances (see also Kuhk 1931, Wittenberg 1963, and Melde 1969). While wire seems to be handled effectively though laboriously, other odd-shaped metal objects cannot make a firm and uniform-sized nest. Thicker wires are avoided because they are too heavy to be carried upwards and perhaps because the bird cannot give it the necessary shape. It is surprising, however, that some crows have a fascination for aluminium shirt hangers even though their wires are too thick for the bird to bend. Such hangers were collected by a friend in South Calcutta from a nest founded on the roof of his house (fig. 8).

Some metal nests were pulled down in 1974, but during the 1975 breeding season at most of those sites new nests of approximately the same weight were rebuilt. The following materials were recorded from metal nests:

1) Dry twigs and brambles at varying proportions;

2) Inner cup made of thin shoots and vegetable fibres (fig. 9);

3) Iron wire, often rusted, pliable and of a particular thickness (ranging between 1.5 and 2.0 mm). The preferred wire is usually 25-30 cm long, each weighing not more than 30 grams (fig. 10);

4) Thin strips of metal, perforated flat sheets, grills, expanded metal, springs, coils, discs, cycle pedals, and even aluminium shirt hangers.

Table 1 gives some information on ten nests built entirely with metallic wire. The nests are arranged in descending order of weight. The weight of a nest varied from about 1 kg to more than 6 kg. The number of wires per nest ranged from 91 to 644. There was a proportional range in the total length of wire per nest which was between 43.76 m and 265.32 m. The wires did not vary much in thickness (table 1). These ten nests were collected from a locality covering a distance of one kilometre.

The data on the number, weight and cumulative length of the wire for the ten nests are given in fig. 11. Excepting for a deviation in nests 3 and 4 which had a proportionately greater number of wires than the others, there is a good correlation between the number weight and length of wire in all nests. This again suggests the homogeneity of the nesting

Table 1

Nests of *Corvus splendens* built completely of wire

Nest	Total weight (kg)	Number of wires	Total length of wire (m)	Mean thickness of wire (mm)
1	6.145	644	265.32	1.77
2	4.894	458	218.94	1.81
3	4.466	497	198.14	1.76
4	4.327	569	209.26	1.80
5	2.690	296	116.97	1.75
6	2.689	288	123.69	1.84
7	2.511	275	99.69	1.68
8	1.910	213	85.00	1.83
9	1.618	187	70.29	1.57
10	1.071	91	43.76	1.69

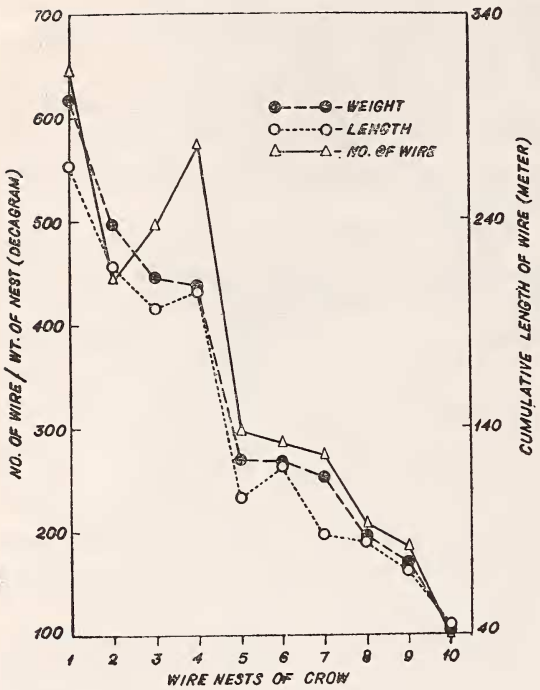


Fig. 11. Number of wires, their weight and cumulative length in 10 pure wire-nests of *Corvus splendens*.

material used. In fig. 12, the frequency distribution of the wire used in nest number 1 from table 1 for their length and weight is shown. While for the majority of the wire the weight is about 10 g, the length ranges from 10 cm to 120 cm with a mode at 30 cm. The longer wires are usually thinner as the bird seems to fix up its limit at 30 g as the weight it can reasonably carry.

Data on four mixed nests gathered from localities about 5 km away from the first one are given in table 2.

These four nests were marked by the presence of twigs and inner fibrous lining. All these nests also had wire. Where more twigs are used, proportionately less metal is supplemented. Flat metals of various size and shape have been used in only two nests. Incidentally, these two nests were pulled down in yet another locality. There are several small workshops in this locality, making small utility articles and toys out of thin metal sheets. Thus, instead of wire, only cut pieces of metallic sheets are available here. Some nests contained a few animal bones, coir rope and clay tea cups.

In another 28 nests of *Corvus splendens* from Calcutta taken in 1975, the following constituents were found (table 3).

In nests 5, 8 and 13, the cup was lined with soft fibre. In nest 7, there was a piece of tyre about 2 cm × 1 cm × 5 cm. Nest 21 had a piece of rope weighing about 10 g.

In some parts of Calcutta and Bombay one

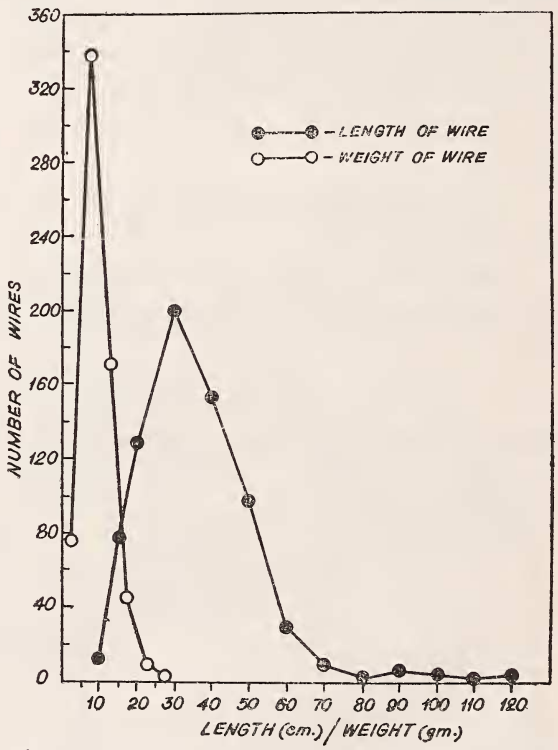


Fig. 12. Frequency distribution of length and weight of wire used by Indian house crows (pure wire-nests).

TABLE 2

NESTS OF *Corvus splendens*: WEIGHT OF CONSTITUENTS OF MIXED NESTS (g)

Nest	Twigs	Inner cup of fibre	Rope	Iron wire	Flat metal small	large	Others	Total weight
1	350	185	—	250	—	—	210	995
2	325	190	—	230	—	—	—	745
3	90	—	30	450	385	160	—	1115
4	45	—	65	765	510	675	—	2060

TABLE 3

DETAILS OF NESTING MATERIALS OF *Corvus splendens* FROM CALCUTTA (IN g)

Nest	Total weight	Wire	Flat iron strips	Flat grills	Springs	Wood	Flexible wire
1	8300	8200	80	—	—	20	—
2	7900	7700	150	—	—	50	—
3	5300	4950	200	—	100	50	—
4	5100	4550	350	200	—	—	—
5	4600	3950	—	150	300	200	—
6	4500	4280	—	180	—	20	20
7	4500	3950	—	350	—	150	50
8	3500	3300	—	—	180	20	—
9	3500	3000	500	—	—	—	—
10	3400	3150	—	—	—	250	—
11	3300	3000	250	50	—	—	—
12	3200	2500	500	200	one long umbrella spoke was used		
13	2800	2300	300	—	50	150	—
14	2700	2600	50	—	—	50	—
15	2500	2300	—	200	—	—	—
16	2200	2000	200	—	—	—	—
17	2000	1850	50	100	—	—	10
18	2000	1600	150	—	—	250	—
19	1700	1700	—	one shirt hanger was used in the nest			
20	1600	1350	—	—	—	250	—
21	1500	1430	—	—	50	—	—
22	1300	800	500	—	—	—	—
23	1200	1180	—	—	—	—	20
24	1100	990	10	50	—	—	20
25	1100	930	100	—	—	—	20
26	800	800	—	incomplete nest		—	—
27	800	800	—	incomplete nest		—	—
28	700	700	—	incomplete nest		—	—

finds crows' nests almost completely built of twigs and natural fibres while in others pure metal nests seem to be the rule. This finding suggests population differences in nidification brought about by the gradual spreading of this habit from individual to individual in the sense of a "tradition" (similar to the titmice of London opening the caps of the milk bottles or the habit of food washing in Japanese macaques).

There is also a pseudo-social trait in this expanding habit of metal nidification: due to the super-annual stability and durability of the metal nests, fairly often two nests, quite apart in the first year, tend to be enlarged the following year thus "growing" into the close neighbourhood of each other (fig. 13) until finally they unite, hence forming a community nest. In such nests, sometimes proper brooding is hardly or not all possible (figs. 14, 15), and yet these nests have successful breeding. A striking example of this type of construction is presented by the "sharing nest" from Barrackpore Trunk Road/Calcutta mentioned above. When pulled down in 1974, the entire nest, completely metal, weighed 25 kg. During the 1975 season also, a multi-nest of almost the original size was made, but could not be weighed. It was striking that no lining with organic material for the egg-cup was provided in any part of the community nest. In fact, because of the lack of a regular cup for laying eggs, eggs from two nests were found to lie side by side.

There are some consequences in the context of the metal nidification habit which deserve mentioning:

1) Making a more permanent, super-annual nest of great stability means reduction of labour and saving time (which is obviously used in the urbanized crows for extensive preening and lazying about near the nest). Wooden nests deteriorate within one monsoon season and have to be rebuilt;

2) Protecting the eggs and young from overheating because the wire-nest is more efficiently aerated than the nest made of organic material. No necessity for the parent birds to carry cooling water to the nest (as, for instance in *Vanellus malabaricus* and other birds);

3) Possibly making use of the solar energy for partial incubation of the eggs for which the metal nest is a necessity (and comes in handy due to its preferred site on human constructions like posts, buildings etc., without much shade);

4) Metal nests have the additional advantage of enabling the parents to incubate the eggs during the warm day time, for at such a weather most of the Indian birds avoid brooding over the eggs;

5) Utilizing more advantageous siting niches where the use of wood as nesting material is impracticable;

6) Placing the wire-nests on or near lamp posts (fig. 16) means extension of time for scavenging and collecting food even at night. Crows pouncing on not properly packed food and food material carried by lorries and on bus tops are a common sight in Calcutta, even after dark.

There is one possible disadvantage for the crows in that due to the thermal conductivity of metal, the naked nestlings could be affected by the hot wires. Another disadvantage concerns man: Due to the nidification ingenuity of the Indian house crow in urban areas, now and then a power cut is caused especially in the rainy season by the crows' wire-nests short-circuiting the overhead power lines. There is evidence that crows at the suburbs of Calcutta and Bombay are gradually switching